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PREDICTORS OF PROLONGED LENGTH OF INTENSIVE CARE UNIT STAY FOLLOWING STAGE I PALLIATION: A REPORT FROM THE NATIONAL PEDIATRIC CARDIOLOGY QUALITY IMPROVEMENT COLLABORATIVE

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Background: While numerous published reports describe predictors of increased mortality among single ventricle patients following Stage I palliation, few focus on predictors of prolonged intensive care unit (ICU) stay. We hypothesize that modifiable peri-operative factors contribute to prolonged ICU stay among single ventricle patients following Stage I palliation.

Methods: The National Pediatric Cardiology Quality Improvement Collaborative (NPC-QIC) is a national data registry for patients with hypoplastic left heart syndrome (HLHS) and its variants. Only individuals who underwent a Norwood or Norwood variant procedure, survived and were discharged to home were included. Prolonged ICU stay was defined as ICU stay longer than 26 days (75th percentile). Non parametric (Kruskal-Wallis test) and categorical analyses were performed. Significance was defined at a p-value < 0.05.

Results: Of the 303 participants, pre-operative risk factors including acidosis, ventilatory support, and having a non-cardiac organ anomaly were associated with prolonged ICU stay ($p < 0.01$). Greater circulatory arrest time, re-operation, use of epinephrine, post operative respiratory insufficiency, and the occurrence of a post operative complication were associated with prolonged ICU stay ($p < 0.03$). Prenatal diagnosis and presence of a genetic syndrome were not associated with longer ICU stay. There was a non-statistically significant tendency toward prolonged ICU stay among Norwood/BT shunt recipients and children with aortic atresia/mitral stenosis or complex single ventricle. A limitation of this study is that entry into the study requires successful discharge from the hospital following Stage I palliation.

Conclusion: Prolonged ICU stay following Stage I palliation is associated with pre-operative acidosis, circulatory arrest duration, post-operative respiratory insufficiency and markers of low cardiac output. While these may each be surrogate markers for sicker patients, improved pre-operative respiratory management, shorter circulatory arrest time, and improved post-operative respiratory management may have a significant impact on prolonged ICU stay following Stage I palliation.